

## CLAIMS

### WE CLAIM:

1. An in-line passive isolation barrier for high-speed serial networks comprising:
  - a housing having a first terminal set receiving a first conductor pair from non-intrinsically safe network and a second terminal set for receiving a second
  - 5 conductor pair from an intrinsically safe network, the housing further containing:
    - a fusible link having a first end joined through the first terminal set to a first conductor of the first conductor pair;
    - a bi-polar voltage sensitive conductor shunting a second end of the fusible link and a second conductor of the first conductor pair; and
    - 10 a matching network in series between the first and second terminal sets to substantially match the impedance of the barrier at the first and second terminal sets to media of the non-intrinsically safe network and intrinsically safe network, respectively.
2. The in-line passive isolation barrier of claim 1 further including a current limiting element in series between the first and second terminal sets.
3. The in-line passive isolation barrier of claim 1 wherein the current limiting element is a resistor.
4. The in-line passive isolation barrier of claim 1 wherein the bipolar voltage sensitive conductor provides a shunt path for voltages in excess of 5 volts.
5. The in-line passive isolation barrier of claim 1 wherein the bipolar voltage sensitive conductor is a parallel combination of zener diodes facing in opposite directions.
6. The in-line passive isolation barrier of claim 1 wherein each zener diode is series connected with a standard diode facing the opposite direction as the zener diode.

7. The in-line passive isolation barrier of claim 1 wherein the bipolar voltages sensitive conductor is the parallel combination of at least four conductive elements each being a series connected zener diode and opposed standard diode, at least one conductive element connected to conduct current in the opposite direction  
5 of another conductive element.

8. The in-line passive isolation barrier of claim 1 wherein the junction of the zener diodes and the standard diodes of conductive elements of the same polarity are joined.

9. The in-line passive isolation barrier of claim 1 further including a DC blocking element in series between the first and second terminal sets.

10. The in-line passive isolation barrier of claim 1 wherein the DC blocking element is a capacitor.

11. The in-line passive isolation barrier of claim 1 is at least two series connected capacitors.

12. The in-line passive isolation barrier of claim 1 wherein the network medium is coaxial cable and the terminals are BNC-type connectors.

13. The in-line passive isolation barrier of claim 1 wherein the terminals are held at opposite ends of the housing.

14. The in-line passive isolation barrier of claim 1 wherein the housing has external indicia indicating which of the terminals is attached to the intrinsically safe network.

15. The in-line passive isolation barrier of claim 1 wherein the housing further includes:

5 a third terminal set receiving a third conductor pair from a redundant non-intrinsically safe network and a fourth terminal set for receiving a fourth conductor pair from a redundant intrinsically safe network;

a second fusible link having a first end joined through the third terminal set to a first conductor of the third conductor pair;

a second bi-polar voltage sensitive conductor shunting a second end of the fusible link and a second conductor of the third conductor pair; and

10 a second matching network in series between the third and fourth terminal sets to substantially match the impedance of the barrier at the third and fourth terminal sets to media of the redundant non-intrinsically safe network and redundant intrinsically safe network, respectively.